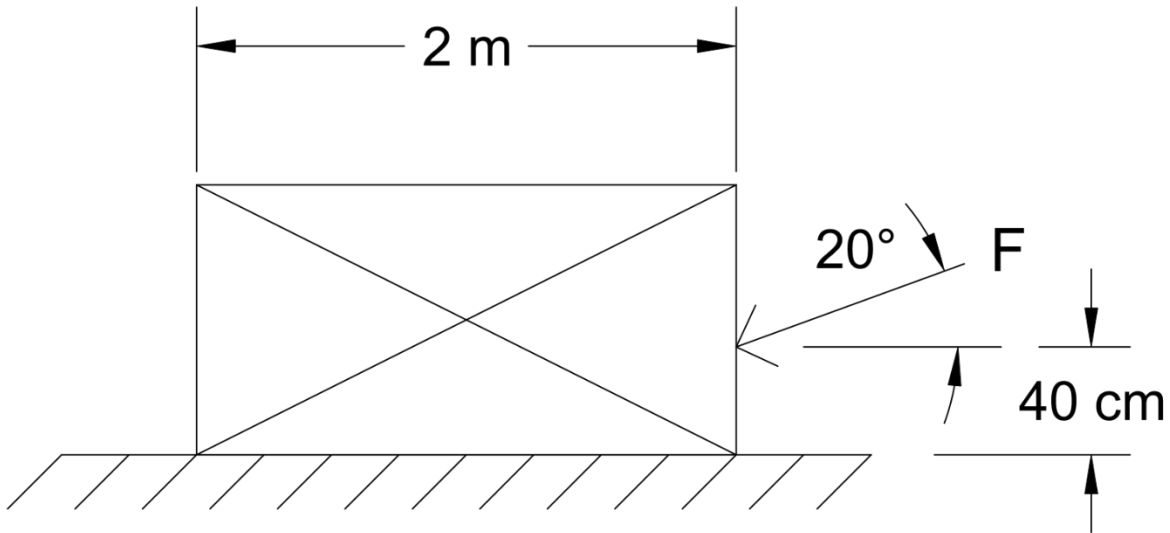
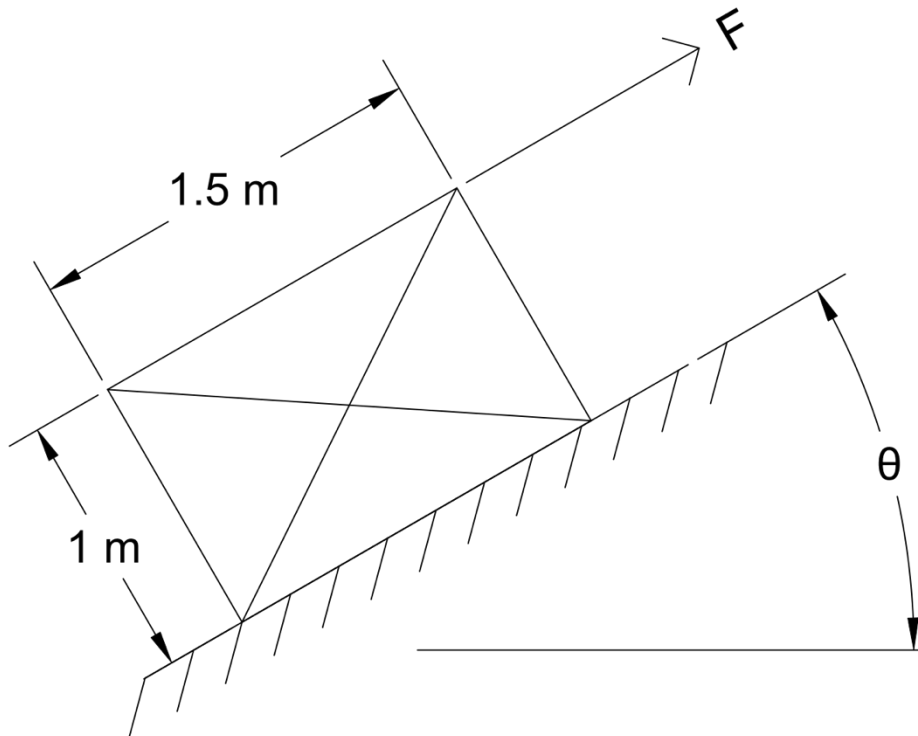


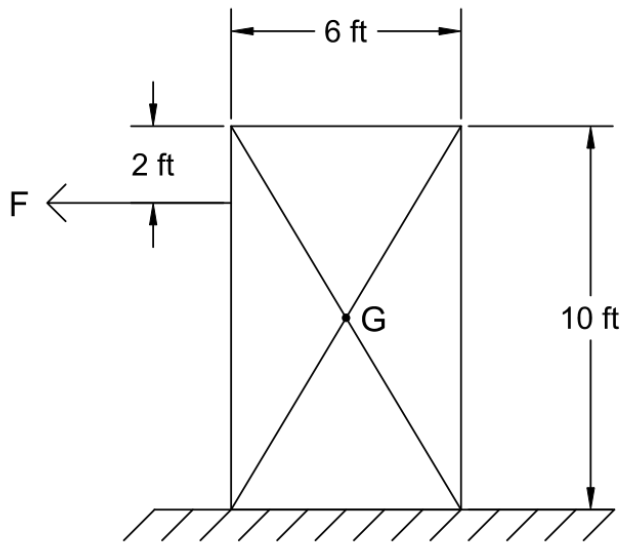
1. The crate has a mass of 50 kg. If a force F of 100 N is applied to the crate, determine if it remains in equilibrium. The coefficient of static friction between the crate and the surface is $\mu_s = 0.2$.



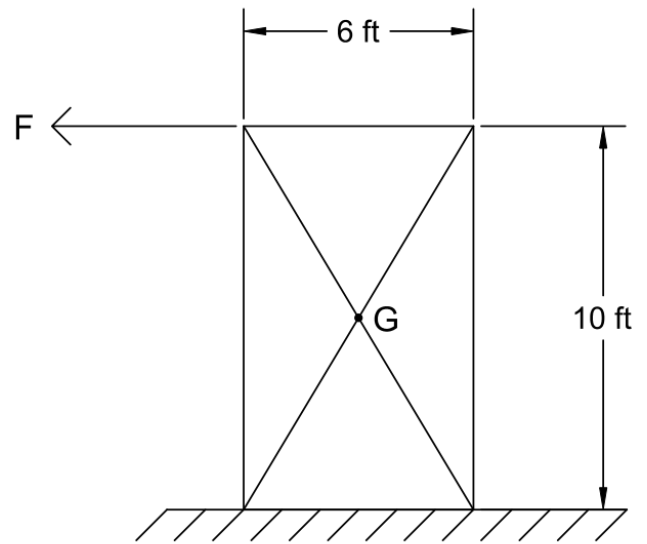
2. The crate has a mass of 30 kg and is resting on a surface inclined at an angle $\theta = 30^\circ$. The coefficient of static friction between the crate and the surface is $\mu_s = 0.25$. Determine the force F required to keep the crate in equilibrium.



3. The 600-lb bookcase has a center of gravity located at point G. The coefficient of static friction between the bookcase and the surface is $\mu_s = 0.35$.
- Determine the minimum force F needed to cause impending motion of the block. If the minimum force is exceeded, does the block slide or tip over?
 - Determine the minimum force F needed to cause impending motion of the block. If the minimum force is exceeded, does the block slide or tip over?



Part a



Part b